



## **OPTICAL FUNCTIONAL ELEMENT**

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### **JAPIO Class:**

- 42.2 (ELECTRONICS--- Solid State Components)

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- R002 (LASERS)
- R095 (ELECTRONIC MATERIALS--- Semiconductor Mixed Crystals)
- R100 (ELECTRONIC MATERIALS--- Ion Implantation)

### **Abstract:**

**PURPOSE:** To provide an element having a laminated waveguide structure which is used for an optical functional element having a filter, a plurality of optical waveguides such as a filter and a demultiplexer.

**CONSTITUTION:** A plurality of waveguides 103, 106 having quantum well structures are formed perpendicularly on a semiconductor substrate 101. The waveguides 103, 106 are laterally confined by diffusing an impurity, implanting impurity ions and heat treating to crystal-mix a clad part extended in parallel direction with the substrate 101. Semiconductor materials 109 having different impurity diffusing speeds are selectively disposed in parallel with the substrate

101, thereby forming the plurality of the waveguides 103, 106 with high degree of designing freedoms. (From: *Patent Abstracts of Japan*, Section: E, Section No. 1565, Vol. 18, No. 326, Pg. 121, June 21, 1994 )

JAPIO

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